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CONTACT DUPLICATING AND RESEAU PRINTER

AND

HIGH RESOLUTION STEP AND REPEAT PRINTER

ELEVENTH MONTHLY LETTER REPORT

JUNE 10, 1965

Period: May 1, 1965, to June 1, 1965

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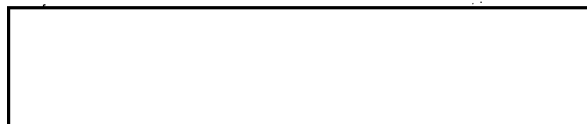


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1.0 CONTACT DUPLICATING AND RESEAU PRINTER

1.1 Purpose

The overall objective of the current contract is the design, fabrication, test, and delivery in fifteen months of a photographic Step and Repeat Contact Duplicating and Reseau Printer. Prime design goals are high speed automatic operation, variable format capability, and high resolution with minimum film distortion or damage. The deliverable equipment will be suitable for operational use. The Printer will accommodate films of 70 mm to 9-1/2" width with frame lengths up to 30 inches and will offer operation in the Reseau mode and Selective mode as options.

1.2 Activity of this Report Period

Final weldment and plating of the Printer framework have been completed, and fabrication and assembly of component parts have been initiated.

An exposure control mock-up was transported to for tests and has resulted in the final selection of lamp spacing and photocell circuits. Increased sensitivity was obtained with the use of a new solid state photocell and by increasing the light source illumination and adding a selective optical filter. It was possible to provide more than adequate light for printing while maintaining sufficient light for sensing. The latter is still marginal, however, and additional tests are being performed to improve sensing sensitivity.

Sample Reseau lines and coordinate symbols were printed on the mock-up, analyzed, and forwarded to the technical monitors along with a list of questions pertaining to final details of the grid. [] STAT

STAT [] has been issued a contract for the Reseau and Clear platens, and drawings of the binding frames have been completed and submitted for quotation.

A new task has been set up with [] to analyze the Test Plan STAT for the Printer. The [] report is scheduled for approximately June 11th, after which the test plan will be submitted to the technical monitors.

STAT Design and development work on the Pre-View and Punch Station has been initiated by [] Agreements were made concerning technical approach and configuration and are being reflected into the final design.

1.3 Plans for Next Period

Final design and fabrication of the deliverable printer will continue.

Testing will continue on the breadboard model, and a test demonstration will be made to the technical monitors during the next reporting period.

1.4 Problems

Program status is presently being reviewed to determine the effect on price and delivery resulting from the delay in Design Plan review and approval.

1.5 Documentation

There was no new documentation this month.

1.6 Questions Outstanding

A list of questions pertaining to details of identification on the Reseau Grid were submitted to the technical monitor, and an early answer is requested to prevent unnecessary delays in fabrication and delivery of the Reseau Grid. *See our memo to PD/OL dated*

2.0 HIGH RESOLUTION STEP AND REPEAT PRINTER

2.1 Purpose

The purpose of this effort is to design, fabricate, test, and deliver in twenty months a high precision Step and Repeat Photographic Contact Printer. This Printer will be capable of producing photographic contact prints of the highest possible quality, resolution, and acutance from roll films of width varying from 70 mm to 9-1/2 inches and in preselected frame lengths from 2-1/4 inches up to a maximum of 30 inches.

2.2 Activity of this Report Period

Procurement and assembly for the breadboard have been completed, and assembly onto the main frame is essentially completed. Full scale testing has started.

Final specification changes were submitted to by the Contracting STAT Officer and are presently under study, along with the effect upon program costs and delivery.

2.2.1 Exposure Control and Light Source

The lamphouse assembly was completed and bench tested. Patterning associated with condensation of mercury and "honeycomb effects" has been observed, and steps are being taken to eliminate the problem.

DC operation of the lamp was abandoned in favor of high frequency AC operation to facilitate design of a modulator and to improve evenness of illumination. A simulated exposure control system including red lamp, sensor, amplifier, modulator, and black light lamp was successfully demonstrated.

Efforts are continuing in the design and fabrication of a high frequency supply and modulator.

2.2.2 Film Gate and Scan Drive

Rolling Air Bag.

Fabrication and assembly of the air bag were completed; initial tests indicated air leakage through the end bearings. Bearing seals have eliminated the problem, and the final assembly was mounted on the test frame.

Vacuum Capstan.

Drag due to the deflection of the outer rotating shell has been eliminated by reworking the inner core, thereby providing increased clearance for the rotating shell. Tests indicate a seven-pound pull on 9-1/2 inch film before slipping. Some leakage is still occurring because the film does not wrap completely over the 90° vacuum area. A new inner core is being fabricated to limit the vacuum area to 70°, which will always be covered by film. It is expected that this modification will eliminate the leakage problems.

Scan Drive.

The scan drive is assembled and in operation on the breadboard. Linearity tests have indicated some velocity variations at the start of the exposure sweep which are partially caused by some undamped bounce of the bag as it is lowered. Methods for more rapid damping are being investigated to reduce the bouncing.

2.2.3 Film Transport

The storage loop amplifier was tested and found to be non-linear and incapable of operation at 100% duty cycle. Modifications have been made, and completion of breadboard packaging will permit full scale testing of the transport with manual starting and stopping. The constant coefficient dampers have been received and installed.

2.2.4 Film Viewer

An infra-red image converter tube scheme was mocked up and tested, but was abandoned because of poor resolution, complex optics, and extremely small viewing area.

A lens-prism optical viewing device utilizing safe light, back-illumination of the platen has produced encouraging results, permitting the operator to view the entire format with normal visual resolution. A full scale version of this scheme is being assembled onto the breadboard to permit studies of final configuration.

2.2.5 Control Electronics

A new control panel has been designed, reflecting all the changes contained in the latest specification revisions, and is being evaluated by human factors engineers. Modifications have been made to the system schematic drawings for incorporation into the final design.

New components required in the control system are being investigated, particularly those associated with frame selection switching and display.

2.2.6 System Test

The first overall test of the full scale breadboard was performed, and a duplicate 9-1/2" x 30" positive print was successfully made of a test negative on 5427 film. The resulting processed print indicated no relative motion of the films, horizontal banding, or Newton fringes, and the negative was reproduced in excellent detail. Some banding along the lamp aperture was observed and is under investigation. There was no evaluation of resolution in this preliminary test, although resolution tests will be conducted upon completion of the lamp power supply.

2.3 Plans for Next Reporting Period

Testing of the full scale breadboard will be continued.

2.4 Problems

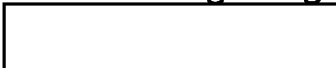
Problems presently exist in the honeycomb patterning of the lamphouse. Revised internal component spacing is expected to alleviate the problem.

2.5 Documentation

Revisions to the specifications have been received and are acceptable as submitted, with the exception of Par. 2.23.6. This paragraph is being reworded and will be submitted to the technical monitor for approval. Cost to complete is being revised to accommodate changes.

2.6 Questions Outstanding

2.6.1 The technical monitor will determine if the facility will have voltage regulation or, if not, the range of voltage to be expected.



the technician discussed the power section on 30 June 65.

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